

AI | Government's Next Frontier

A SURVEY OF ARTIFICIAL INTELLIGENCE PROGRESS
AND PURSUITS IN THE FEDERAL GOVERNMENT

Presented by

GENERAL DYNAMICS
Information Technology

In Partnership with

**Government
Business
Council**

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Foreword

AI is the next frontier and for some it's already here.

The research report you're holding is the product of a partnership between GDIT and Government Business Council to understand the state of AI advancements in the federal government today. AI tools are being used across government to automate many tasks, from identifying risks to preventing cyber attacks, to predicting network system maintenance.

Machine learning models built with deep learning neural networks are being used to identify fraudulent transactions, assess risk for travelers, adjudicate benefits claims, manage disease, assess genomic expression data, screen airport luggage, and more.

The government mission owners we surveyed are aware that AI holds great opportunity but also great responsibility. Without strong advocacy from top leadership, the workforce is reluctant to put their trust in a technology which evades easy explanation.

By leveraging proven AI tools and services to construct solutions, cultivating AI knowledge across the enterprise and strengthening data-science talent as well as developing trusted advisor relationships with reputable technology partners, there is a viable path forward to real progress.

But U.S. investments in AI must not wane, and the 73% of government employees we surveyed who believe AI will be very or extremely important to preserving American sovereignty in the years ahead are 100% right.

Alan Turing, considered the father of artificial intelligence, once said: "We can only see a short distance ahead, but we can see plenty there that needs to be done." AI provides us an aperture through which we can see much further than we've ever seen and a mechanism to achieve breakthroughs that elevate government missions and people.

Dave Vennergrund, Director of AI and Data Insights
GDIT Digital Consulting and Solutions

Overview

PURPOSE

British mathematician and father of artificial intelligence, Alan Turing, said in 1950: “We can only see a short distance ahead, but we can see plenty there that needs to be done.”

More than half a century later, the U.S. federal government is synching up to Mr. Turing’s vision. The establishment of a joint AI research center in 2018, the release of a White House Executive Order in 2019 and allocations of more than \$1 billion to nondefense spending on AI in 2020 paint a clear picture: artificial intelligence is here, and it’s going to change the nature of government.

But will it usher in a ‘brave new world’ of possibility, or could it marginalize the very people it was meant to serve? What questions does it raise about trust and expertise? Is it possible for federal employees to work in tandem with a machine that could perform their job faster, more accurately and at significantly less expense to the organization?

Up to now, no report exists that answers these questions or conveys the direct sentiments and concerns that federal employees have regarding AI. For this reason, GDIT and Government Business Council undertook the following in-depth research study.

METHODOLOGY

Government Business Council and GDIT Insights released a survey on October 19, 2019 to a random sample of *Government Executive*, *Nextgov*, and *Defense One* online subscribers. 658 federal government respondents participated in the survey, 59 percent of whom hold positions in the Senior Executive Service or rank at the GS/GM-13 level or above. Respondents include representatives from more than 30 federal agencies, including both defense and civilian agencies.

For a more detailed description of demographics, please refer to the Respondent Profile on page 29.

Executive Summary

EMPLOYEES SEE AI AS A CRITICAL VALUE INVESTMENT IN THE NATION'S FUTURE

The future of the country hinges on how it addresses AI now, according to respondents. They rank AI as one of the top three technologies with the potential to transform future operations in their government agency. With leading global powers pumping ever-greater resources into their own AI programs, 73 percent of respondents believe it will be very or extremely important for the United States to invest in AI immediately to maintain technological leadership in the years to come. Close to a third of respondents say their organization views AI as a mission enabler that can push the limit of what is possible.

AGENCY LEADERS STRUGGLE TO DEMYSTIFY AI'S POTENTIAL IMPACT

Although federal employees see the potential value in AI, agencies struggle to relate the value back to their mission. In fact, 41 percent of federal employees think AI can drastically transform the operations of their agency. AI's value proposition, however, remains uncertain to organizations as a whole given 32 percent of respondents say their organizations have yet to clarify its value, and 43 percent say AI is not even on their agency's radar. Agency leaders' perceptions of AI's value are also unclear to a majority of federal employees who suggest that greater top-down transparency and advocacy of AI development is important for progress in AI.

LACK OF TRUST POSES A MAJOR BARRIER TO AI IMPLEMENTATION

Forty two percent of federal respondents take the view that AI applications are slightly - or not at all - trustworthy. Levels of trust correlate with perceptions of AI security, suggesting that trust is not inherent but rather gained. 24 percent consider AI to be a security risk, and 16 percent say it is a black box requiring further demonstration to be understood. Over half of respondents point to the need for increased training/reskilling as a top priority for AI deployment, which if implemented correctly could help alleviate major trust concerns around the technology.

RELIANCE ON LEGACY ARCHITECTURES STALLS THE GOVERNMENT-WIDE AI PUSH

A year has passed since the White House issued an Executive Order pushing federal agencies to invest in AI tools, but nearly a third of those surveyed say the Order has done nothing to overhaul existing budget considerations. More concerningly, 42 percent say their agency's legacy IT architecture is simply incompatible with available AI solutions. Going forward, it will be key for organizations to break free from legacy architectures and onboard platforms that can facilitate a wide range of AI solutions.

AI | EXPANDING HUMAN CAPACITY

A 2019 White House Executive Order obliges federal agencies to prioritize adopting Artificial Intelligence to help advance U.S. technological leadership. GDIT and Government Business Council conducted a comprehensive research study examining federal sentiments and the progress being made on the implementation of AI.

658 FEDERAL GOVERNMENT RESPONDENTS

59% OF RESPONDENTS GS/GM 13 LEVEL AND ABOVE

30 FEDERAL DEFENSE AND CIVILIAN AGENCIES REPRESENTED



73%

think that AI will be very or extremely important for U.S. sovereignty in coming years



41%

think AI can transform their organizations' internal operations, particularly in analytics

BARRIERS TO IMPLEMENTATION

INVESTMENT FUNDING PRIORITIES

57%

say there will be less or static AI spending in 2020

TRUST DEMYSTIFYING AI

39%

believe a lack of trust is holding their agency back from adopting AI

IMPACT

TAPPING INTO ITS POTENTIAL

43%

say AI is not even on their agency's radar

LEGACY IT SYSTEMS MODERNIZING EXISTING ARCHITECTURE

42%

note a need to modernize legacy IT to adopt AI

MOVING FORWARD

UNDERSTAND MISSION NEEDS



LEVERAGE TRUSTED AI SOLUTIONS



CULTIVATE DATA SCIENCE TALENT



DEVELOP PARTNER ECOSYSTEM

Read the full survey report [here](#).

METHODOLOGY

The survey was fielded on October 19, 2019 to a random sample of Government Executive, Nextgov, and Defense One online subscribers. 658 federal government respondents participated in the survey, 59 percent of whom hold positions in the Senior Executive Service or rank at the GS/GM-13 level or above. Respondents include representatives from more than 30 federal agencies, including both defense and civilian agencies.

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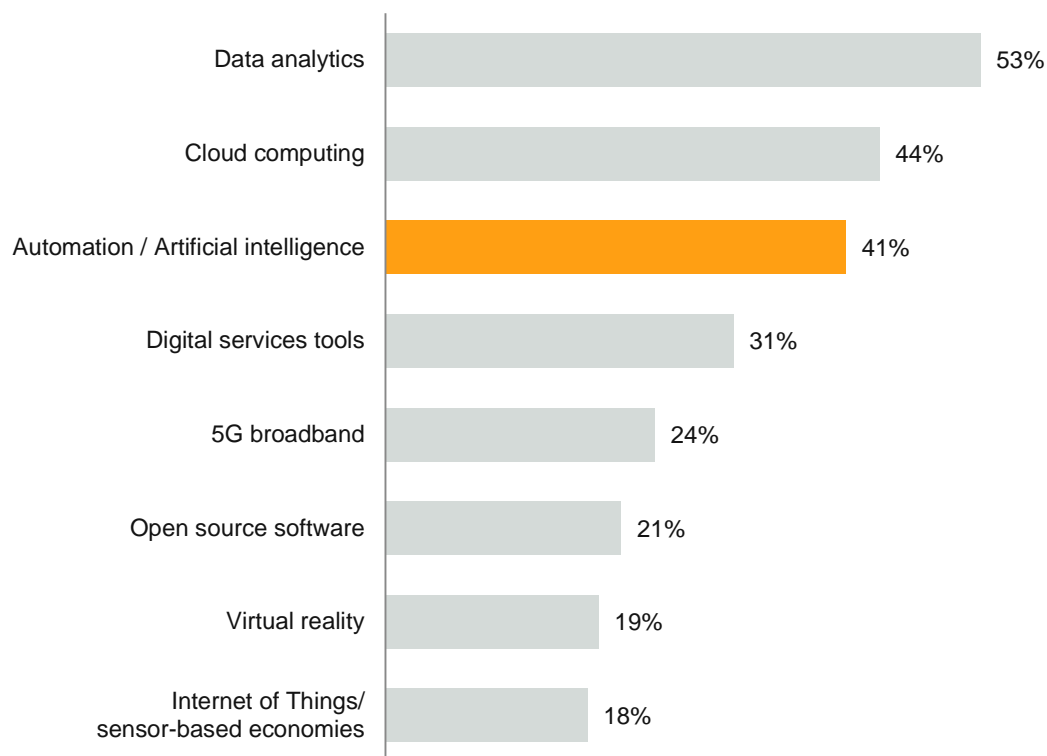
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An underwater photograph of a cave passage. The walls and floor are composed of large, dark, jagged rock formations. A wooden ladder is visible in the distance, leading up towards a bright opening at the end of the passage. The water is clear and blue, with light filtering through from above, creating a shimmering effect on the surface.

Research Findings

AI advancements rise to principal priority in government's future

Which technology trend listed below has major potential to transform the future of operations within your organization? Please select all that apply.



Percentage of respondents, n=658
Respondents were permitted to select all that apply

41%

of respondents believe automation and artificial intelligence could dramatically impact their organization's operations in coming years.

"Failure to adopt AI will result in legacy systems irrelevant to the defense of our people, eroding cohesion among allies and partners, reduced access to markets that will contribute to a decline in our prosperity and standard of living, and growing challenges to societies that have been built upon individual freedoms."

Excerpt from the Department of Defense 2018 Artificial Intelligence Strategy

DoD: "Summary of the 2018 Department of Defense 2018 Artificial Intelligence Strategy." February, 2019. [Link](#)

“We are in a race for AI adoption supremacy, internationally.

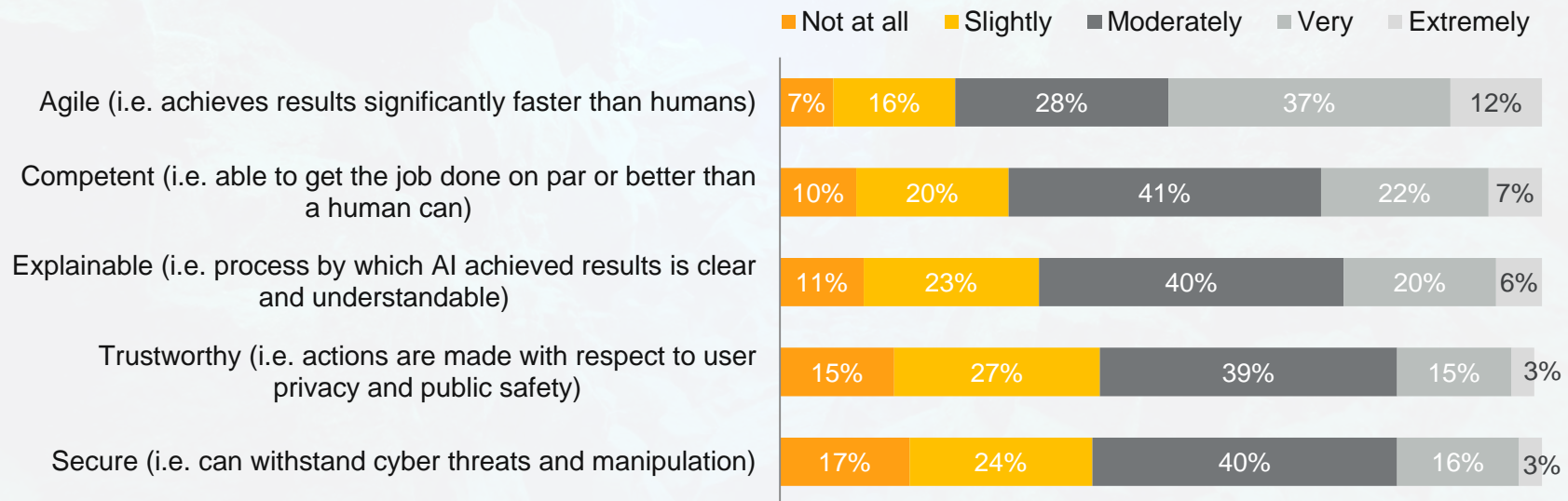
Something as emerging and disruptive and as potentially transformational as artificial intelligence technology needs to be treated with a degree of seriousness — of import to national security as well as economic security and economic competitiveness.

We’re approaching this much like the Atomic Energy Association approached the power of the atom back in the days of the Manhattan Project. It is that important to the future of geopolitical power.”

Bill Turenne Jr., Director of Communications and External Relations
Artificial Intelligence & Technology Office (AITO)

Respondents show faith in AI’s agility and competence, but are more skeptical on matters of trust and security

“To what extent do you perceive applications of AI as _____?”



Percentage of respondents, n varies: 473-475
 Note: Percentages may not add up to 100% due to rounding

42% of respondents view applications of AI as **slightly** or **not at all** trustworthy.

Takeaway: AI’s core competency and speed can’t be denied, but how it communicates action vs. intent to humans – deserves a skeptical eye.

“While it’s true that AI is complex, I would argue that not understanding how something works does not mean I don’t trust it.

To me, this is a red herring argument. How many database users understand a hashing algorithm? Lack of understanding does not equate to lack of trust.

We are living in an AI Renaissance built on the success of Deep Learning AI solutions. We're seeking to make every action intelligent, combining advanced technology and intimate mission knowledge to continuously expand the ways AI can be trusted and applied to enhance machine potential and expand human capacity.”

Dave Vennergrund, Director of AI and Data Insights
GDIT Digital Consulting and Solutions

24%

of respondents believe their leaders have fairly assessed the pros and cons of AI, and determined it is a capability worth pursuing.

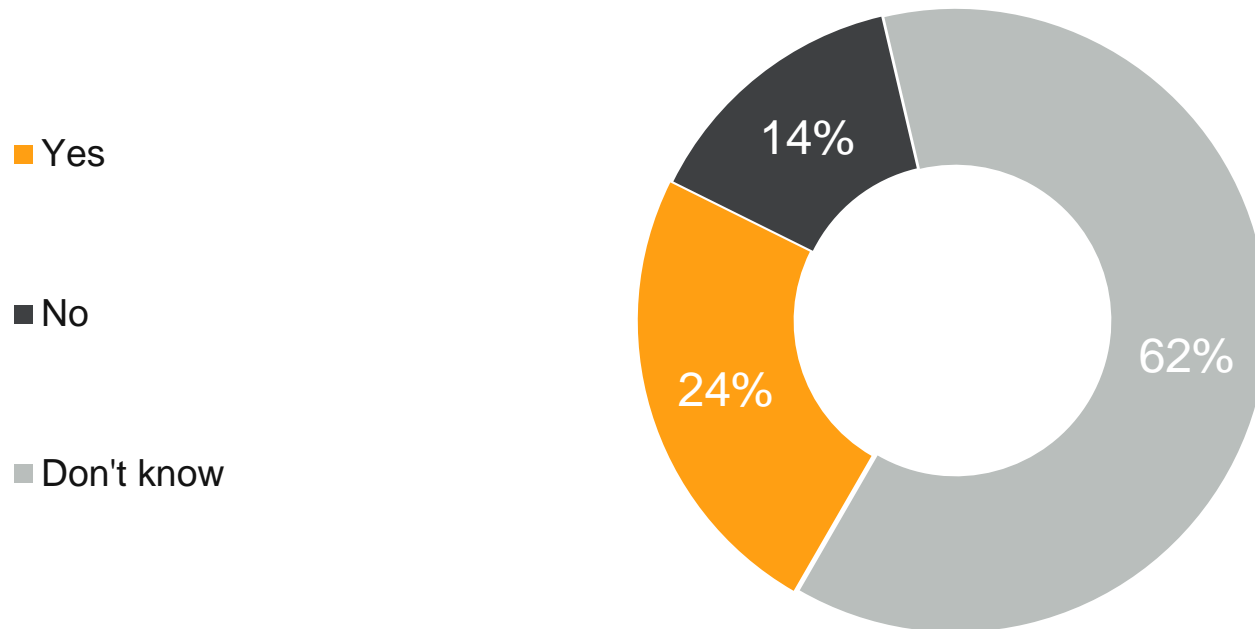
62%

of respondents are uncertain of what their leadership believes on the matter.

Takeaway: The lack of strategic consensus from the top likely keeps AI a secondary priority at many agencies. Leaders have an obligation to educate themselves on AI so that they can decide if it is right for their workforce in the long term.

Overall, agency leadership has yet to clarify the long-term rationale for AI investments

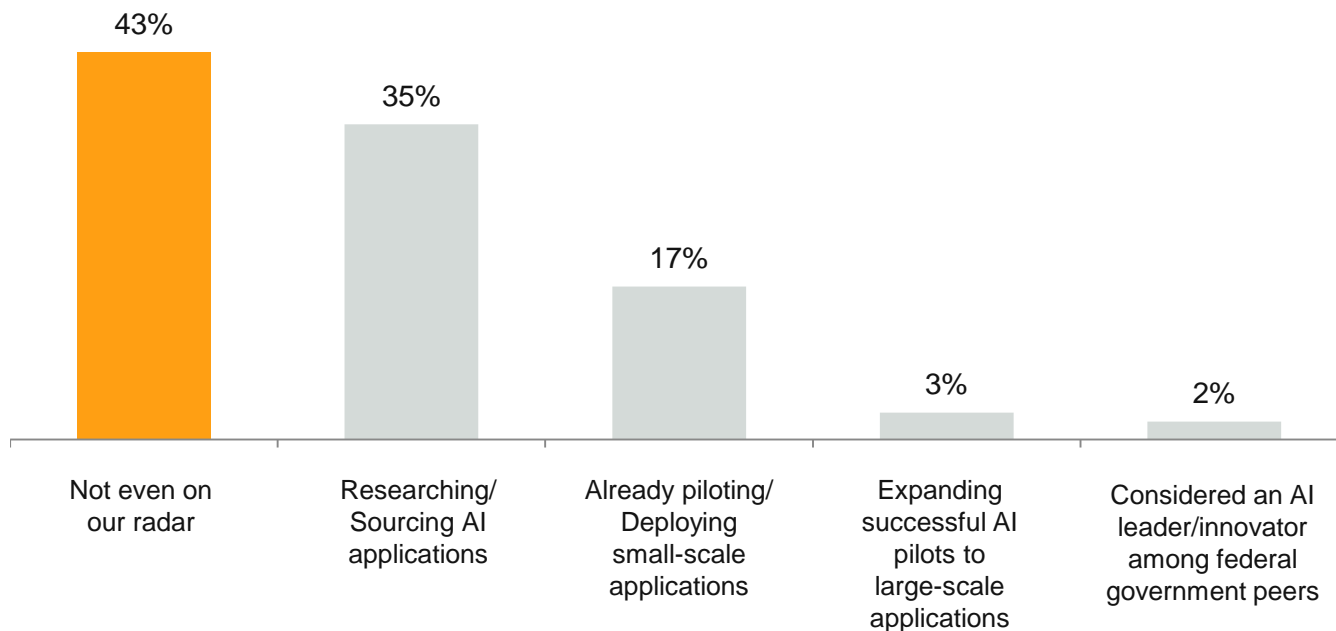
Does your organization's leadership believe the potential value AI provides ultimately outweighs the potential risk(s) associated with its use?



Percentage of respondents, n=462
Note: Percentages may not add up to 100% due to rounding

Despite progress by some, agencies have yet to embrace AI capabilities

To the best of your knowledge, how would you describe your organization's current AI maturity?



Percentage of respondents, n=459
 Note: Percentages may not add up to 100% due to rounding

22%

of respondents have either piloted small-scale AI programs or expanded them to various degrees of competence.

However, 43% say AI isn't even on their agency's radar.

Another 35% acknowledge AI in their future, but have so far only committed to researching capabilities.

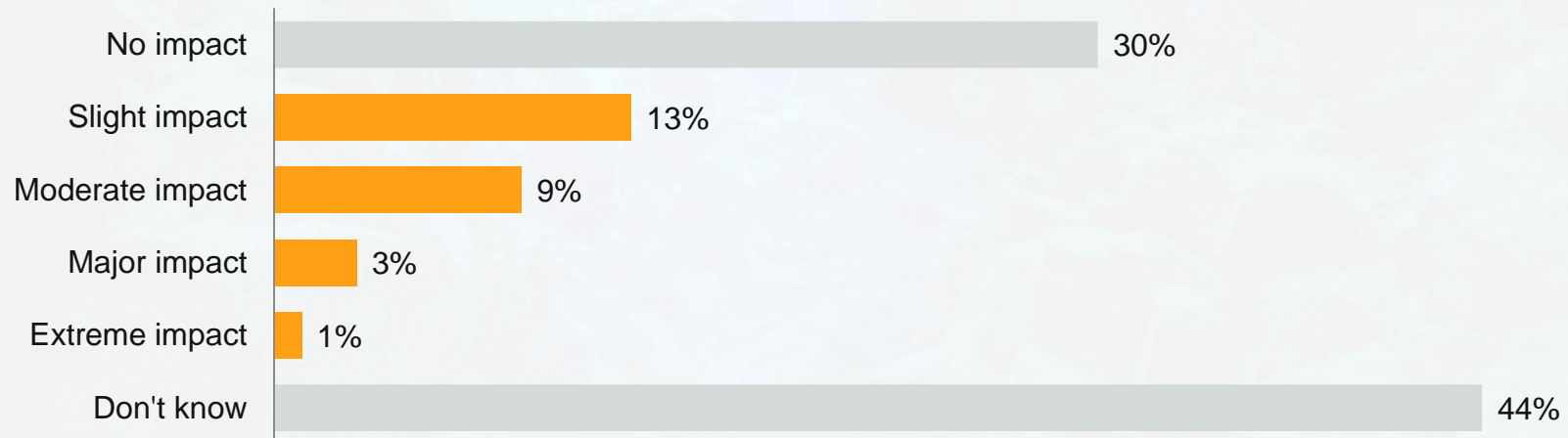
“We are establishing an entirely new paradigm for translating insights about the brain to improve AI.

We have to start by scoping how brains are different from what we already understand. And then we can start to build up a new grammar and a new set of operating principles that meaningfully describe computation in the biological brain.”

Dr. David Markowitz, Program Manager of MICrONS & MIST, IARPA

The White House has sought to prioritize AI, but the actual impact on agencies is still being tallied

In February 2019, the White House released an Executive Order on “Maintaining American Leadership in Artificial Intelligence.” What impact has the order had in refocusing your agency to prioritize AI over competing budget considerations?



Percentage of respondents, n=461
Note: Percentages may not add up to 100% due to rounding

26% of respondents believe the White House Executive Order has made some degree of impact in refocusing their agency investments toward AI.

55%

of respondents are unsure whether their organization has an AI strategy to guide adoption and buying of AI.

“I would love to see some type of information paper generated by my agency that provides information and insights on how we intend to utilize AI in the future -- sort of a broad strategic vision along with some current or planned examples of how the agency intends to utilize AI at the tactical level at front-line facilities.

Essentially, right now there is a void of information on this topic among senior officials who are not directly involved in AI.”

Remarks from anonymous Senior Executive Service respondent

Just 1 in 4 respondents acknowledge their agency has a strategy guiding AI implementation

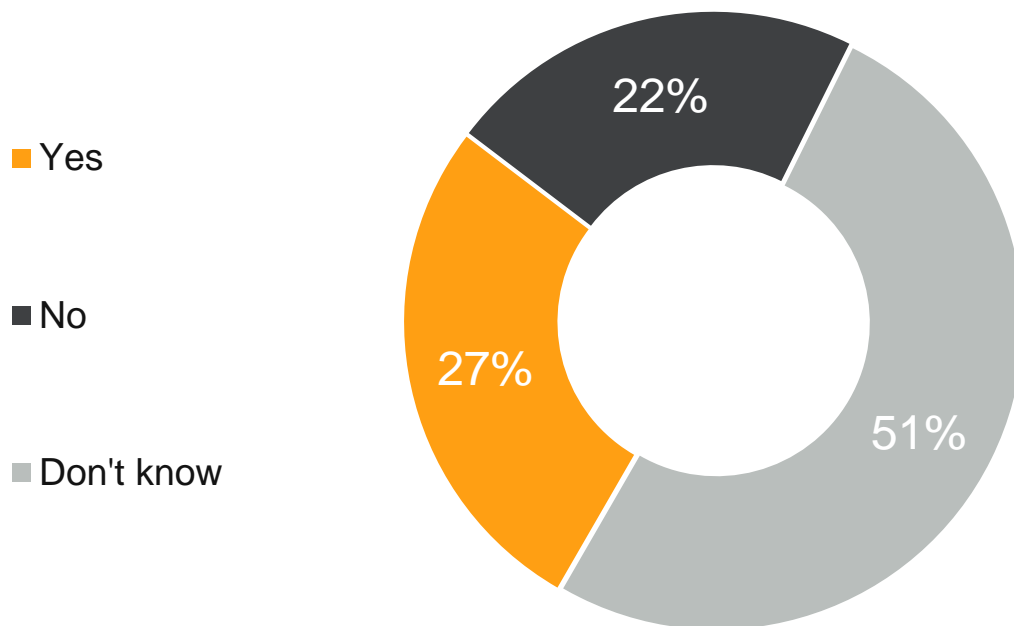
Does your organization have a strategic framework guiding policy, adoption, and/or potential opportunities around AI?



Percentage of respondents, n=260
 Note: Percentages may not add up to 100% due to rounding

Less than a third of those surveyed say their agency has a dedicated task force guiding AI adoption

Does your organization have an embedded team or knowledge center dedicated to onboarding / testing AI technology?



Percentage of respondents, n=462
Note: Percentages may not add up to 100% due to rounding

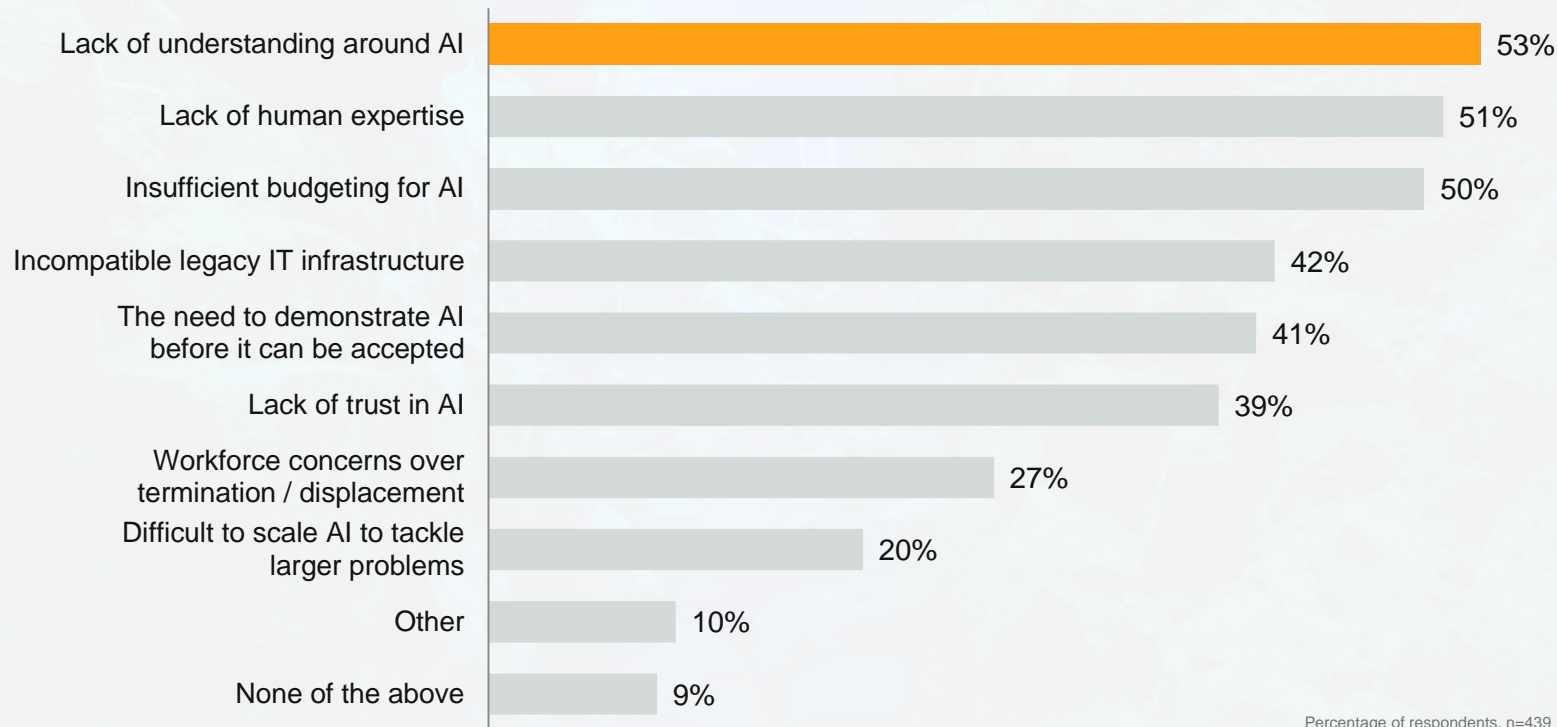
27%

of respondents acknowledge the existence of a knowledge center or team force whose job is to lead implementation of AI.

Over half of respondents say AI is misunderstood and falls short of needed expertise and funding

RESEARCH FINDINGS

Top Pain Points to Introducing AI



Percentage of respondents, n=439
 Respondents were asked to select all that apply

53% of respondents believe a lack of understanding around AI is holding their agency back from deploying such tools.

“The impact AI will have on jobs is a hotly debated topic with solid reasoning on all sides.

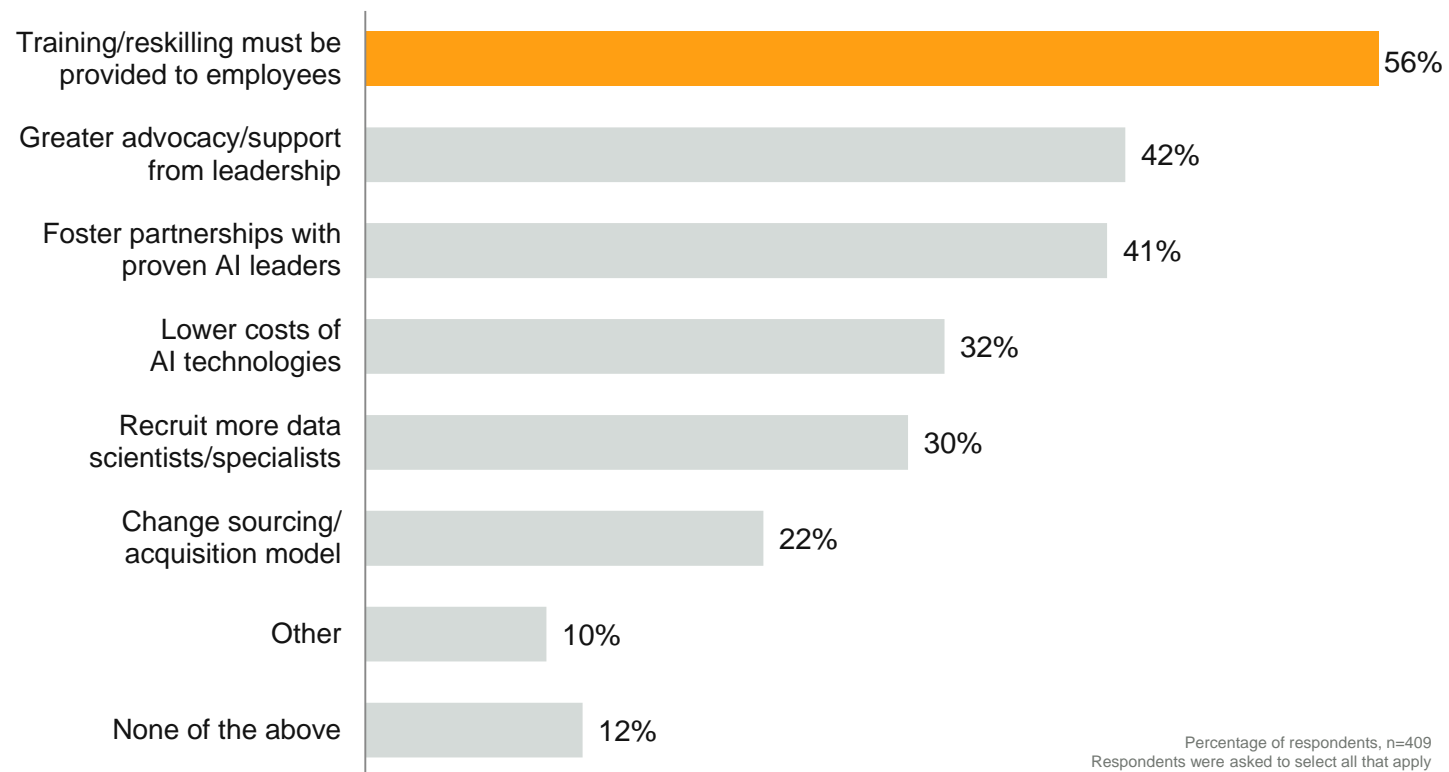
Most agree that AI will automate many jobs. Some argue that AI will permanently remove classes of jobs. Others counter that it will create new jobs that have more strategic or productive impact. I favor this argument, because it has historical precedent. New job creation followed the industrial and information revolutions.

We lost lamp lighters yet the light bulb has generated new jobs and possibilities in new industries.”

Dave Vennergrund, Director of AI and Data Insights
GDIT Digital Consulting and Solutions

Employee training and reskilling is paramount to broader workforce acceptance of AI

What must happen in order for your organization to make greater progress with respect to AI?

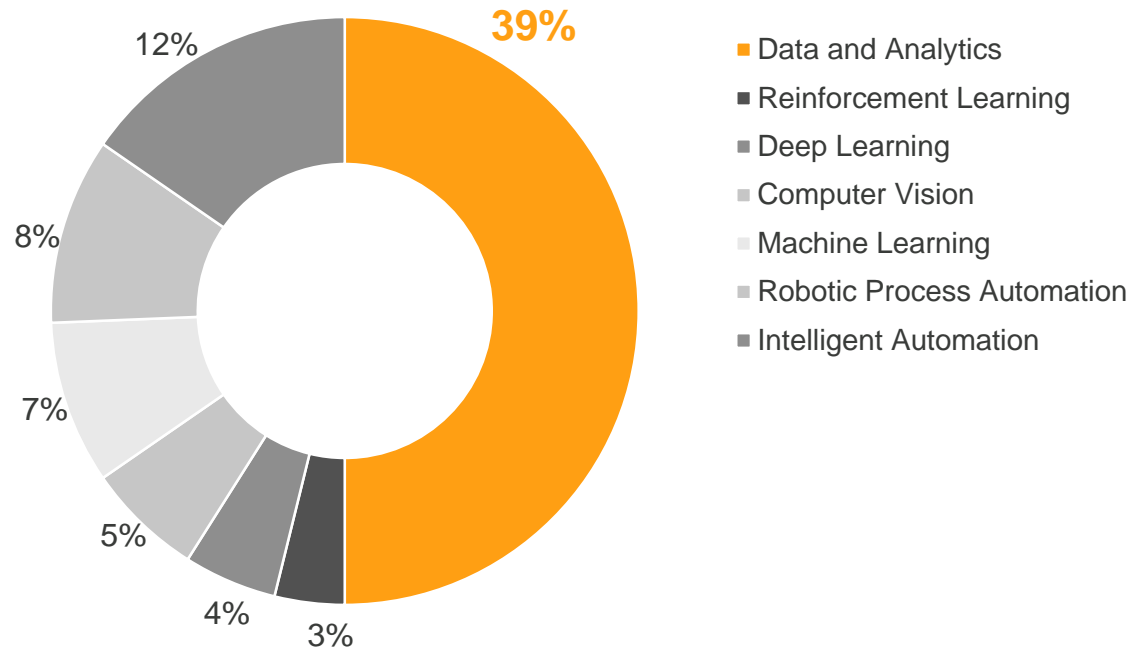


“We are scientists, we are biologists. If AI can be used to collate and analyze data, in relation to a myriad of variables – including climate effects and socio-economic data – and be able to create user-friendly models that biologists can quickly plug into, that would be useful.”

Remarks from anonymous GS-13 Respondent

Among all its applications, AI’s potential to transform analytics garners the greatest expectation

Which specific AI technology generates the most excitement within your organization?



Percentage of respondents, n=409
 Note: Percentages may not add up to 100% due to rounding
 Note: Not shown are 19% of respondents selecting “None of the above”

“We've had over 1,200 scientists, engineers, and program managers, both from labs, companies, and universities involved in this road mapping process.

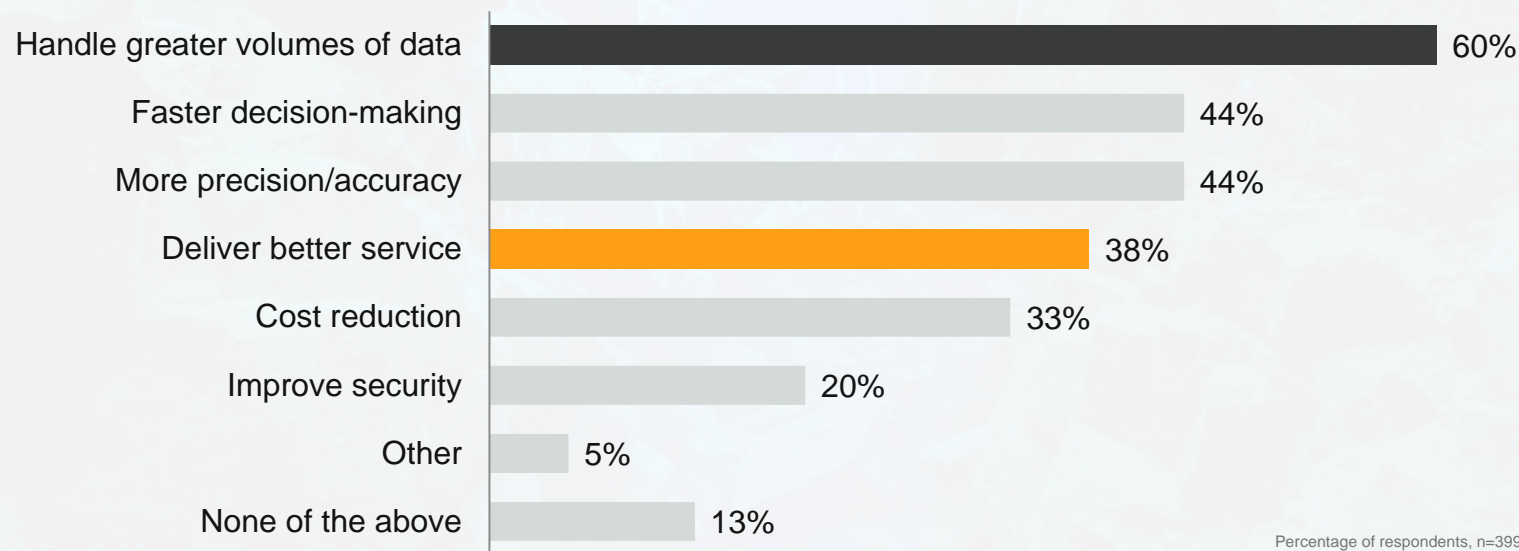
These were substantial discussions, multi-day workshops, intense breakouts — really asking people what might be possible over the next 10 years and even beyond. What are the big transformational opportunities?

Automating experimental labs, changing the way we collect data and make data available, changing how simulations and AI are coupled, and really building a leadership team across the country. That's what we've been working on and it's a big deal.”

Rick Stevens, Associate Laboratory Director
Argonne National Laboratory

60% of respondents believe AI could help process and improve their agency's data overload

What value do you see AI providing your organization, specifically? Please select all that apply.



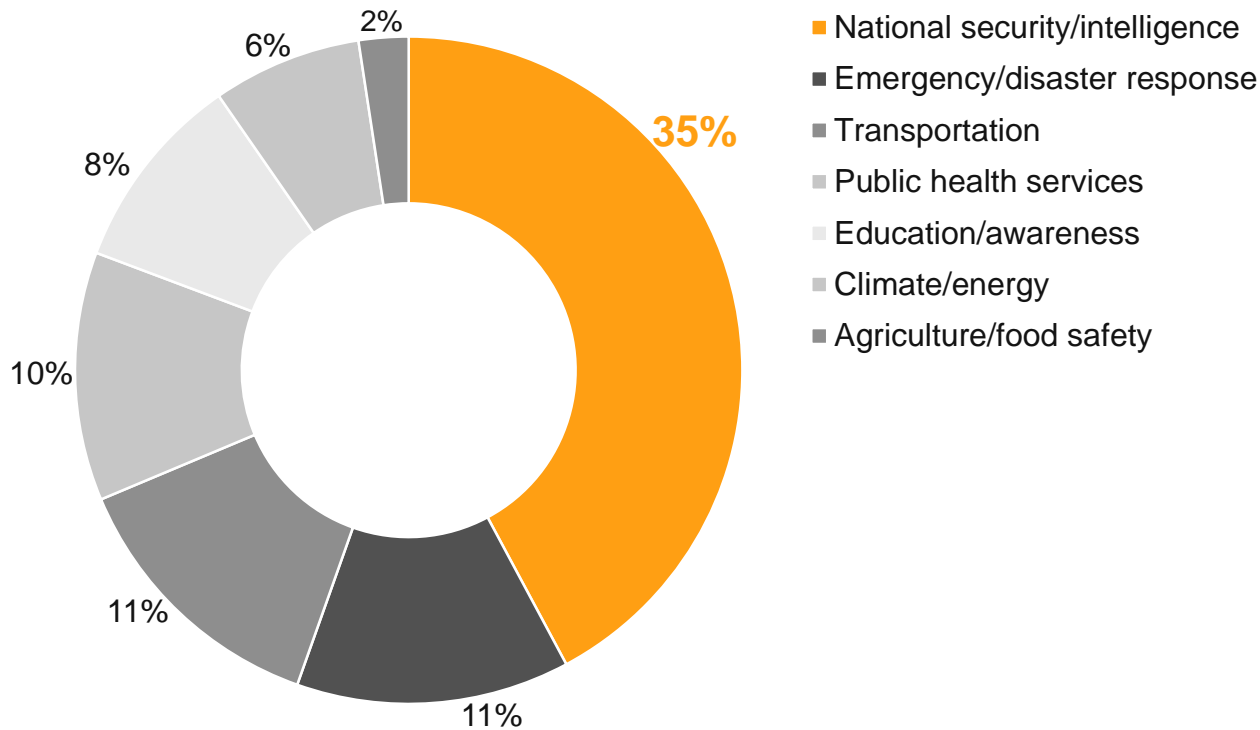
Percentage of respondents, n=399
 Respondents were asked to select all that apply

38%

of respondents believe AI can bring value to their organization by improving basic delivery of citizen services.

U.S. national security is poised to reap the greatest benefit from continued AI investment

Where do you anticipate AI can produce the greatest value to federal government and/or defense applications?



Percentage of respondents, n=399
 Note: Percentages may not add up to 100% due to rounding
 Note: Not shown are 10% of respondents selecting "None of the above"

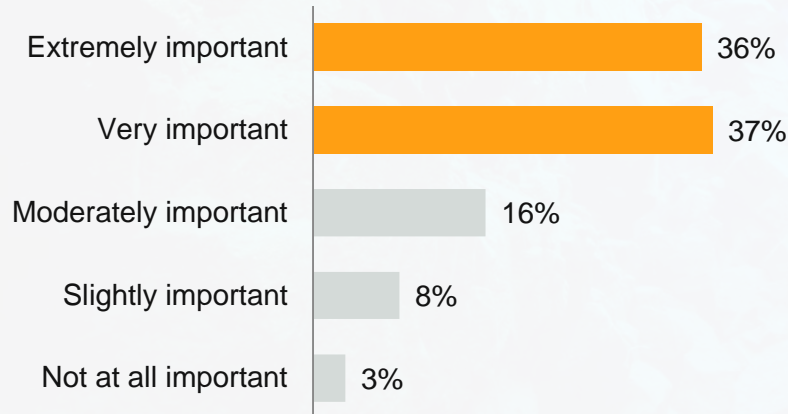
By a considerable margin, respondents believe AI will produce the greatest value for agencies involved in national security and intelligence.

“The US Government makes critical use of machine learning (ML) analytics in defense of national security. One of the primary defining characteristics of a “national security” analysis is the existence of adversaries who seek to sap, even suborn, that analysis.”

Dr. W. Philip Kegelmeyer, Sandia National Laboratories

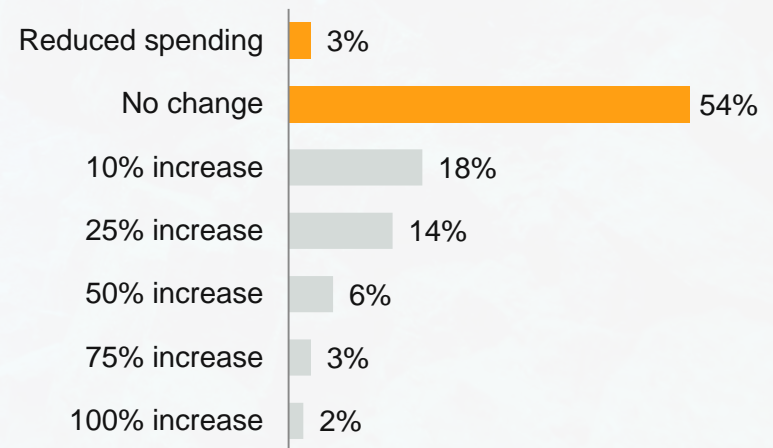
Respondents say AI is critical to American technological leadership, but only 43% believe greater investments will come in 2020

How important is it for the United States to invest in AI now in order for it to maintain its status as a world power?



Percentage of respondents, n=392
 Note: Percentages may not add up to 100% due to rounding

Compared to past year's levels, how much do you anticipate your organization will invest in AI tools in 2020?



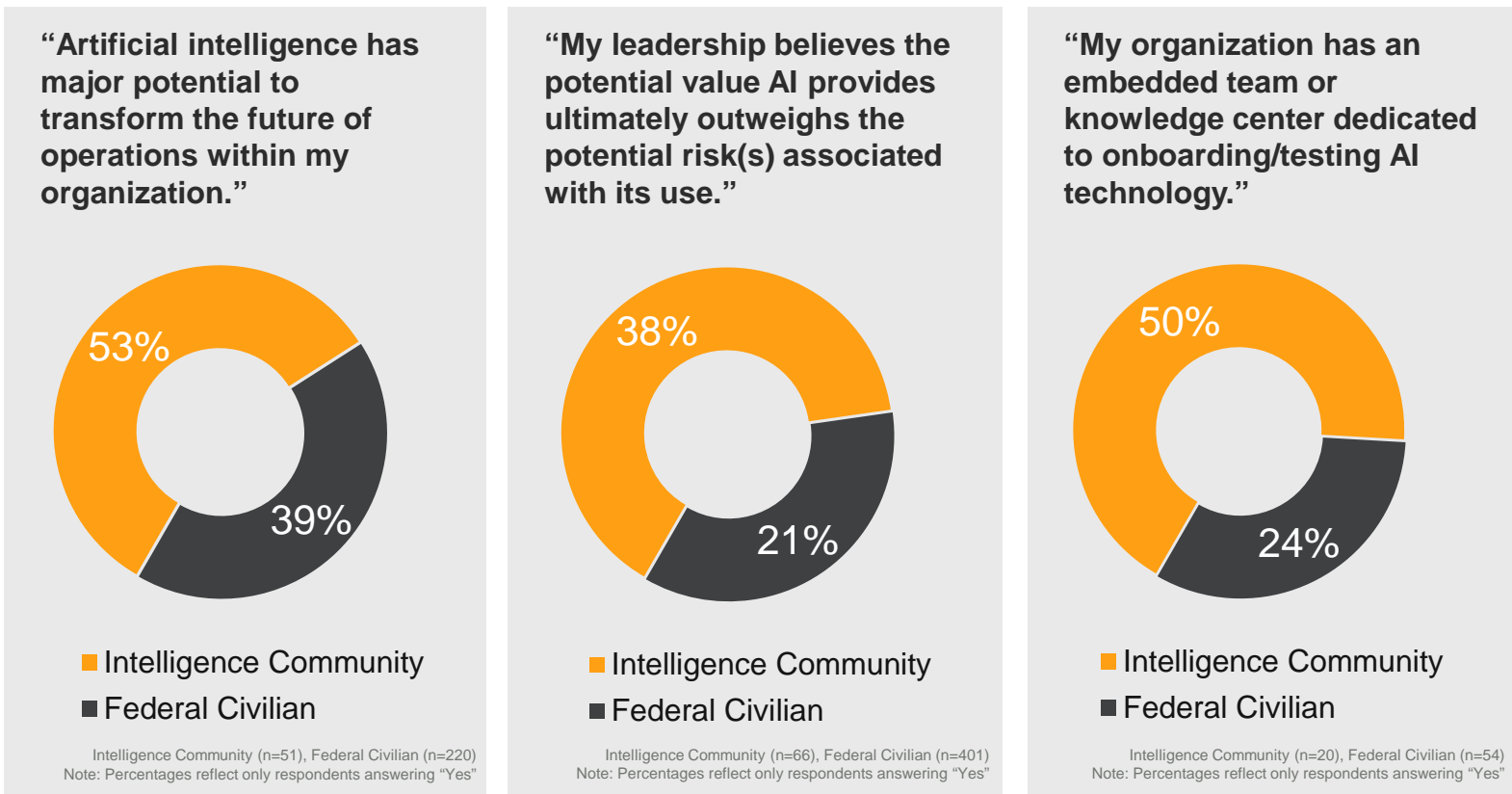
Percentage of respondents, n=389
 Note: Percentages may not add up to 100% due to rounding

73% believe American investments in AI are very or extremely important to the nation's future position as a world power.

57% say there will be less spending available or no change whatsoever in AI spending heading into 2020.

THE INTELLIGENCE DIVIDE 

Respondents in the Intelligence Community signal greater progress on AI initiatives than that witnessed by their non-IC federal counterparts

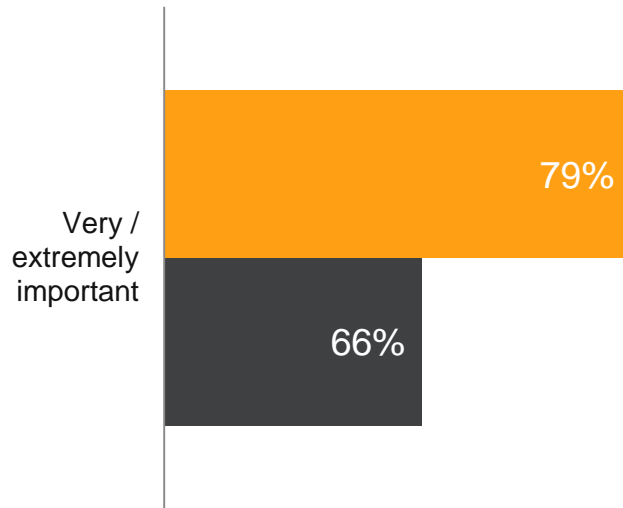


In recent years, Intelligence Community (IC) members have taken aggressive steps to onboard AI capabilities for the purposes of securing foreign intelligence operations abroad and critical infrastructure back home. The IC members surveyed in this study represent a sampling of member agencies, including CIA, FBI, DHS, Energy, NGA, and IARPA.

THE LEADERSHIP DIVIDE 

Top leadership identifies a greater need for AI advancement than respondents lower in rank

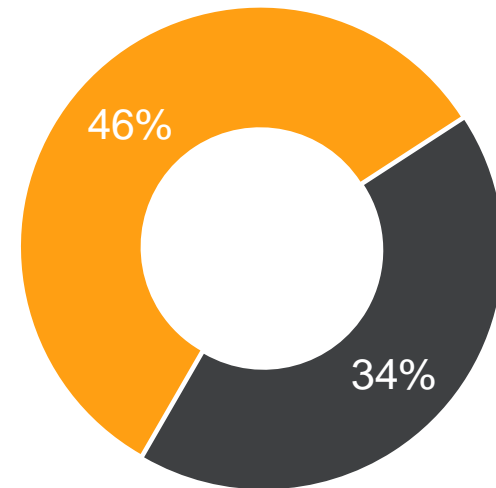
How important is it for the United States to invest in AI now in order for it to maintain its status as a world power?



- GS-13 and above
- GS-12 and below

GS-13 and above (n=230), GS-12 and below (n=167)
Percentages reflect only those respondents answering "Very important" or "Extremely important"

"Artificial intelligence has major potential to transform the future of operations within my organization."



- GS-13 and above
- GS-12 and below

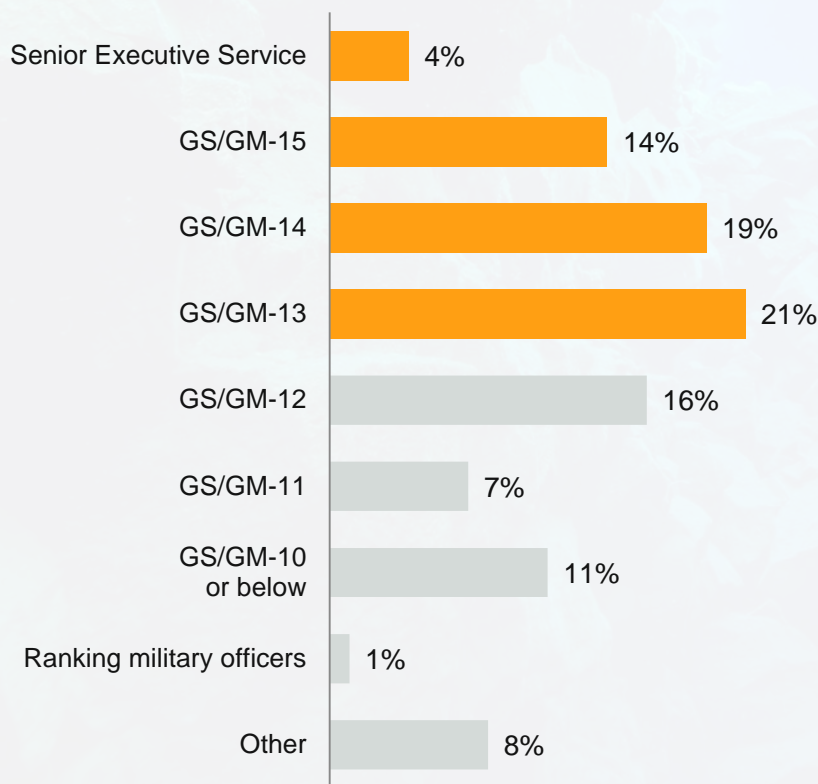
GS-13 and above (n=391), GS-12 and below (n=278)
Note: Percentages may not add up to 100% due to rounding

An underwater photograph of a cave passage. The walls and floor are composed of large, dark, jagged rock formations. A metal ladder is visible in the distance, leading up towards a bright opening at the end of the passage. The water is clear, and the lighting is a deep blue-green, creating a mysterious and somewhat claustrophobic atmosphere.

Respondent Profile

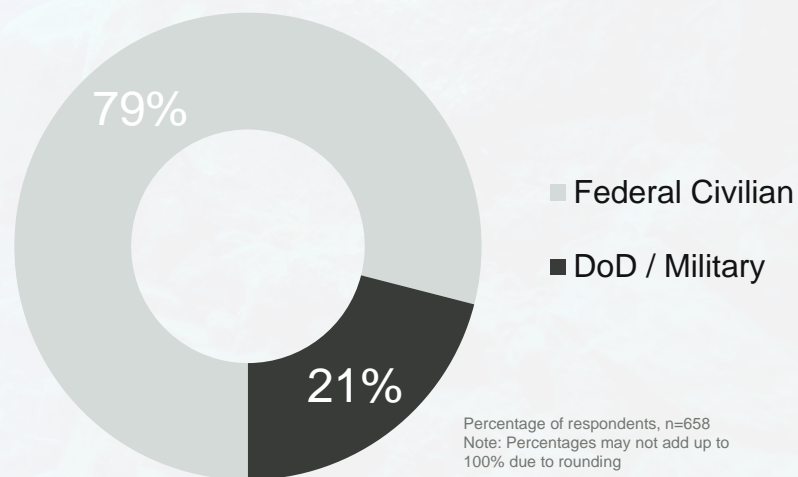
A majority of respondents are senior federal decision-makers

GRADE/RANK



Percentage of respondents, n=658
 Note: Percentages may not add up to 100% due to rounding

EMPLOYMENT



Percentage of respondents, n=658
 Note: Percentages may not add up to 100% due to rounding

59%

of respondents identify as GS-13 or above, including members of the Senior Executive Service, General/Admiralty, and Major/Commander.

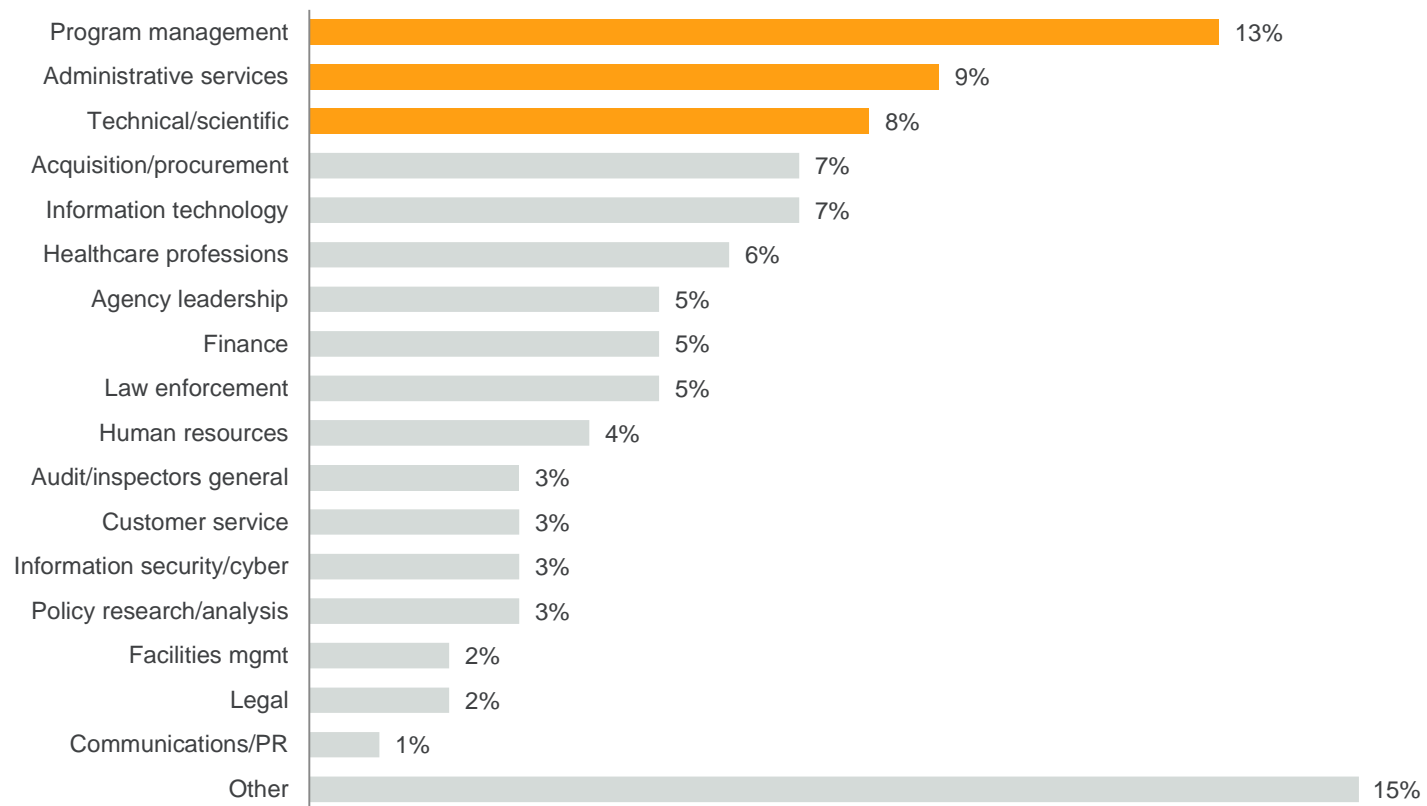
21%

respondents are civilians working in the Department of Defense or registered as Active Duty Military.

Program managers, administrative officers and technical specialists are most widely represented in cohort

Job Function

Respondents were asked to choose which single response best describes their primary job function.



Percentage of respondents, n=392
Note: Percentages may not add up to 100% due to rounding

More than 30 federal agencies are represented in the study

DEPARTMENTS AND AGENCIES REPRESENTED

Agriculture	Interior
Air Force	Justice
Army	Labor
Central Intelligence Agency	Marine Corps
Combatant Commands	NASA
Commerce	Navy
Congress/Legislative Branch	Office of Personnel Management
Education	Other Independent Agency
Energy	Secretary of Defense
Environmental Protection Agency	Small Business Administration
Executive Office of the President	Social Security Administration
General Services Administration	State
Government Accountability Office	Transportation
Health & Human Services	Treasury
Homeland Security	Veterans Affairs
Housing & Urban Development	

Percentage of respondents, n=660
Departments and agencies are listed in order alphabetically.

About



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We are GDIT. The people supporting some of the most complex government, defense, and intelligence projects across the country. We deliver. Bringing the expertise needed to understand and advance critical missions. We transform. Shifting the ways clients invest in, integrate, and innovate technology solutions. We ensure today is safe and tomorrow is smarter. We are there. On the ground, beside our clients, in the lab, and everywhere in between. Offering the technology transformations, strategy, and mission services needed to get the job done.

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